

1948

# ALFALFA

COST AND MANAGEMENT STUDY

# ANTELOPE

# VALLEY

Compiled by the  
AGRICULTURAL EXTENSION SERVICE  
University of California and United States Department of Agriculture  
Cooperating with  
Alfalfa Growers of the Antelope Valley  
Los Angeles County, California

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INTRODUCTION

This study was made by the Agricultural Extension Service of the University of California and the United States Department of Agriculture in cooperation with alfalfa growers of the Antelope Valley.

Seven growers cooperated in the study by making their records available on 556 acres of alfalfa.

The purpose of this study is to analyze the costs, returns, and water use of alfalfa hay in order that growers may compare their records and when possible eliminate uneconomical practices. The returns and water use of alfalfa may be compared with that of new crops.

Similar studies were conducted in 1931 to 1934, inclusive. Although the average cost of alfalfa hay production has risen from \$73.42 an acre in 1934 to \$141.21 an acre in 1948, the grower's profit has increased from \$14.14 an acre in 1934 to \$50.34 in 1948.

A summary of the 1931 to 1934 studies is included in order to show the returns from alfalfa hay production during years of low prices.

It is hoped that this study will be of interest and value to the growers of the area.

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TABLE 1. GENERAL SUMMARY OF ALFALFA RECORDS OVER 6 YEARS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	1931	1932	1933	1934	4-year avg.	1947	1948
Number of records	15	12	12	17	14	10	7
Total acres in study	759	549	686	1124	780	543.5	556
Av. no. acres per record	51	46	57	66	56	54	79.4
Yield - tons per acre	6.12	5.80	5.44	6.95	6.08	6.94	6.15
Av. price received per ton	\$11.02	\$ 9.67	\$10.59	\$12.60	\$11.05	\$ 24.06	\$ 31.12
Cost of production	13.48	10.98	11.72	10.56	11.65	19.49	22.94
Net profit per ton (-Loss)	\$-2.46	\$-1.31	\$-1.13	\$ 2.04	\$ -.60	\$ 4.57	\$ 8.18
Cultural labor cost per acre	9.61	4.71	5.93	7.95	7.05	25.87	25.59
Harvesting labor	23.73	12.05	10.54	13.57	14.97	43.70	41.67
Total labor cost per acre	\$33.34	\$16.76	\$16.47	\$21.52	\$22.02	\$69.57	\$67.26
Material cost per acre	16.91	17.43	16.21	23.22	18.44	25.13	28.74
Cash overhead cost per acre	7.71	5.23	6.48	5.56	6.25	8.02	12.71
Total cash costs per acre	\$57.96	\$39.42	\$39.16	\$50.30	\$46.71	\$102.72	\$108.71
Depreciation per acre	13.15	14.15	14.27	13.15	13.68	17.11	15.83
Sub-total	\$71.11	\$53.57	\$53.43	\$63.45	\$60.39	\$119.83	\$124.54
Interest on investment	11.19	10.18	10.44	9.97	10.45	15.39	16.67
Total all costs per acre	\$82.30	\$63.75	\$63.87	\$73.42	\$70.84	\$135.22	\$141.21
Total income per acre	67.40	56.16	57.67	87.56	67.20	172.03	191.55
Net profit per acre	-14.90	-7.59	-6.20	14.14	-3.64	36.81	50.34
Capital & management income	- 3.71	2.59	4.24	24.11	6.81	52.20	67.01
Average investment per acre	186.55	169.74	174.02	166.21	174.13	307.72	333.46
Rate earned on investment	- 2.0%	1.5%	2.4%	14.5%	3.9%	17.0%	20.1%
Net cash income	\$ 9.44	\$16.74	\$18.51	\$37.26	\$20.49	\$69.31	\$82.84

A comparison of six alfalfa cost studies made in the Antelope Valley during 1931, 1932, 1933, 1934, and 1947 and 1948 is presented in the above table.

Column (5) shows the average cost and income per acre for the four years of low hay prices (1931-34). Due to the increase in hay prices, the net returns were much greater in 1947 and 1948.

Inspection of column (7) will show that alfalfa enterprises covered by the 1948 study produced a capital and management income of \$67.01 in 1948 as compared to \$6.81 for the four-year average. This is 20.1% interest on the average investment of \$333.46 an acre. This is the result of an average yield of 6.15 tons per acre which brought \$31.12 a ton. The income of \$191.55 an acre was \$50.34 higher than the total of all costs, \$141.21 an acre, when interest on investment is included as a cost. Capital and management income, which is the amount by which income exceeds cash costs and depreciation on the facilities used, was \$67.01 an acre.

The net cash income shown on the last line of the table, which is the amount left after all cash costs have been deducted, was \$82.84 per acre in 1948 and \$20.49 an acre for the 1931-34 average.

TABLE 2. GENERAL SUMMARY - YIELDS, COSTS, INCOME AND EARNINGS PER ACRE

(1) Serial No.	(2) No. acres	(3) Yield- tons per acre	(4) Average price per ton	(5) Income per acre	(6) Cultural labor costs	(7) Harvest labor	(8) Mater- ial costs	(9) Cash over- head	(10) Depre- cia- tion	(11) Interest on invest- ment	(12) Total costs	(13) Manage- ment income	(14) Capital and manage- ment inc.	(15) Income above cash costs
7	40	8.75	\$33.23	\$290.74	\$30.80	\$65.40	\$35.23	\$14.77	\$19.73	\$15.84	\$181.77	\$108.97	\$124.81	\$144.54
5	41	6.90	32.18	222.35	27.09	41.34	31.70	9.19	13.16	13.84	136.32	86.03	99.87	113.03
11	145	6.51	32.77	213.36	15.17	49.65	23.30	11.43	16.03	15.73	131.31	82.05	97.78	113.81
12	32	7.80	31.52	245.98	42.00	43.39	26.52	19.24	17.59	20.15	168.89	77.09	97.24	114.83
13	38	5.71	30.75	175.59	30.63	35.54	21.91	10.29	15.92	18.37	132.66	42.93	61.30	77.22
10	60	5.62	30.59	171.77	40.15	31.41	25.02	8.38	17.97	14.09	137.02	34.75	48.84	66.81
14	200	5.20	28.79	149.85	23.85	35.18	33.54	14.67	14.50	18.00	139.74	10.11	28.11	42.61
Av. All 1948	79.4	6.15	\$31.12	\$191.55	\$25.59	\$41.67	\$28.74	\$12.71	\$15.83	\$16.67	\$141.21	\$ 50.34	\$ 67.01	\$ 82.84
Average of 10 records in 1947														
1947	54.4	6.94	\$24.06	\$172.03	\$25.87	\$43.70	\$25.13	\$ 8.02	\$17.11	\$15.39	\$135.22	\$ 36.81	\$ 52.20	\$ 69.31

Each record in the study is given a serial number (column 1) and they are arranged in descending order of management income per acre. For sake of convenience they are kept in the same order in subsequent tables. Column 2 shows the acreage harvested in each record. Columns 3, 4, and 5 show the average yield in tons, price of hay per ton, and the total income per acre. Column 6 shows the total labor and field power for all cultural operations up to harvest. Column 7 shows the total harvesting labor and field power costs. Column 8 shows the total cost of all materials used such as water, fertilizer, seed, wire, etc. Column 9 includes taxes, insurance, minor repairs, and 5% interest on operating capital. Depreciation (10) is the annual charge made on pumping plants, pipelines, tillage and harvesting equipment, etc. based on the length of useful life of the facility. Interest on investment (11) is the charge made for the use of capital and is calculated at 5%. Total costs (12) is the sum of all these costs. Management income (13) is the amount remaining after all the costs are subtracted from total income. Capital and management income (14) is management income plus the interest charge. Income above cash costs (15) is capital and management income plus depreciation. The average for the 10 records in the 1947 study is shown on the last line at the bottom of the table.

TABLE 3. YIELDS, INCOME, AND COSTS PER TON

(1) Serial no.	(2) Yield per acre	(3) Income from hay	(4) Cultural labor & field power	(5) Harvest labor	(6) Mater- ials	(7) Cash over- head	(8) Total cash costs	(9) Depre- cia- tion	(10) Interest on invest- ment	(11) Total all costs	(12) Mgt. income	(13) Capital and mgmt. income	(14) Income above cash costs
7	8.75	\$33.23	\$ 3.52	\$7.47	\$4.03	\$1.69	\$16.71	\$2.25	\$1.81	\$20.77	\$12.46	\$14.27	\$16.52
5	6.90	32.18	3.92	5.98	4.59	1.33	15.82	1.91	2.00	19.73	12.45	14.45	16.36
11	6.51	32.77	2.33	7.62	3.58	1.76	15.29	2.46	2.42	20.17	12.60	15.02	17.48
12	7.80	31.52	5.38	5.56	3.40	2.46	16.80	2.26	2.58	21.64	9.88	12.46	14.72
13	5.71	30.75	5.37	6.22	3.84	1.80	17.23	2.78	3.22	23.23	7.52	10.74	13.52
10	5.62	30.59	7.15	5.59	4.46	1.49	18.69	3.20	2.51	24.40	6.19	8.70	11.90
14	5.20	28.79	4.58	6.76	6.44	2.82	20.60	2.79	3.46	26.85	1.94	5.40	8.19
Av. all 1948	6.15	\$31.12	\$ 4.16	\$6.77	\$4.67	\$2.06	\$17.66	\$2.57	\$2.71	\$22.94	\$ 8.18	\$10.89	\$13.46
Average of 10 records in 1947													
1947	6.94	\$24.79*	\$ 3.73	\$6.30	\$3.62	\$1.15	\$14.80	\$2.47	\$2.22	\$19.49	\$ 5.30	\$ 7.52	\$ 9.99

\*Includes \$ .73 income from seed and pasture

This table is set up similarly to table 2 and the calculations are made on a ton basis. Total cash costs (8) is a total of all costs per ton without including depreciation and interest on investment as a cost. It includes the cost of the operator's labor. Total cash costs for 1948 varied from \$15.29 to \$20.60, with an average of \$17.66 per ton. All costs (11) varied from \$19.73 to \$26.85, with an average of \$22.94 per ton. Management income (12) varied from \$1.94 to \$12.60 with an average of \$8.18 per ton. Income above cash costs, the difference between total income per ton and the total cash costs, varied from \$8.19 to \$17.48 with an average of \$13.46.

TABLE 4. IRRIGATION - DATA ON WELLS, WATER USE, AND COSTS PER ACRE

(1) Serial no.	(2) Depth (feet)	(3) Wells				(6) Age (years)	(7) Irrigation			(10) Power	(11) Irrigation costs per acre					(15) Total costs
		(3) Size casing	(4) Pump- ing lift	(5) Rate of flow	(7) No. appli- cations		(8) Acro inch per applic.	(9) Total ac.ft. per acre	(11) Depre- cia- tion		(12) Inter- est at 5%	(13) Total water costs	(14) Irrig. labor			
7	515	14-10"	150'	70"	4	25	4.1	8.6	\$28.90	\$9.42	\$4.42	\$42.74	\$30.20	\$72.94		
5	500	12-10"	168'	50"	28	8	**	**	27.08	4.59	2.30	33.92	21.07	54.99		
11	504*	14-12"	-	140"	-	16	5.6	7.5	16.63	5.38	2.69	24.70	15.17	39.87		
12	330	12-10"	170'	60"	-	14	7.2	8.4	21.84	5.82	2.91	30.57	42.00	72.57		
13	183	12"	120'	40"	20	21	5.8	10.1	16.75	4.56	2.28	23.59	26.84	50.43		
10	450	12-10"	125'	67"	19	**	**	6.6	20.20	6.49	2.61	29.30	37.67	66.97		
14	300*	12-10"	160'	160"	19	14	5.6	6.5	24.72	5.06	2.53	32.31	22.50	54.81		
Av. all 1948	397	-	149'	40-160"	4-28	8-25	4.1-7.2	7.3	\$21.88	\$5.59	\$2.70	\$30.17	\$24.09	\$54.26		
Average of 10 records in 1947																
1947	450	-	136'	61"	14	15.5	4.9	6.7	\$18.32	\$8.47	\$3.97	\$30.76	\$23.89	\$54.65		

\* More than one well

\*\* Information not available

Table 4 presents a breakdown of irrigation costs, practices, and well data. The number of irrigations (7) varied from 8 to 25. The volume of water used per acre (9) varied from 10.1 to 6.5 acre feet with an average of 7.3 acre feet. Columns 10, 11, 12, and 13 show the cost of delivering water to the field. Irrigation labor (14) includes all labor of applying water to the field. Column 15 is the total cost of pumping and applying water to one acre. In records 11 and 14 more than one well was pumping water into the pipe lines.

Irrigation is one of the most important problems in Antelope Valley. Each grower should carefully study the requirements for his land and adopt the methods that will meet these needs.

TABLE 5. YIELD AND PRICE BY CUTTINGS - PER ACRE AND PER TON

Serial no.	(1) First Cutting		(2) Second Cutting		(3) Third Cutting		(4) Fourth Cutting		(5) Fifth Cutting		(6) Other income per acre	
	Average yield tons	Average price	Average yield tons	Average price	Average yield tons	Average price	Average yield tons	Average price	Average yield tons	Average price	Pasture and straw	Seed
7	2.11	\$33.00	2.05	\$30.00	1.78	\$35.00	1.78	\$35.00	1.03	\$34.00	-	-
5	1.25	*	2.24	*	1.66	*	1.00	*	.75	*	-	-
11	1.04	33.00	1.99	30.50	1.10	34.00	1.17	34.00	1.20	34.00	-	-
12	1.88	31.30	1.84	31.00	1.59	31.00	1.46	32.00	1.03	33.00	work stock	
13	1.71	29.00	1.37	26.68	1.21	34.00	.87	34.00	.55	34.00	-	-
10	1.25	31.69	1.47	28.53	1.41	30.57	.98	31.04	.51	33.00	-	-
14	Not broken down by cuttings											
Av. all 1948**	1.54	\$31.60	1.83	\$29.34	1.46	\$32.91	1.21	\$33.21	.85	\$33.60	-	-
Average 10 records in 1947												
1947	1.40	\$24.41	1.68	\$21.22	1.48	\$23.06	1.32	\$26.60	1.15	\$26.57	\$4.18	\$12.60

\* Information not available

\*\* Simple averages of records where information was available

Table 5 presents an analysis of yields per acre and price received per ton by cuttings of alfalfa. Other income (6) per acre in the figures for 1947 is from the sale of pasture, alfalfa seed, and alfalfa straw.

It will be noted that the second cutting produced the highest average yield per acre with the lowest average price.

TABLE 6. HARVESTING, FERTILIZER, AND OTHER COSTS

Serial no.	(1)	(2)	(3)	(4)	(5)	(6)	(7) (8) (9)			(10)	(11)	(12)
	Mowing per acre	Raking & bunching per acre	Harvesting Baling wire per acre	Costs Baling per ton	Stacking per ton	Hauling per ton	Fertilizer per acre			Renovating per acre	Seeding labor per acre	Cost of seed per acre
							Kind	Amount	Cost			
7	\$ 6.00	\$ 4.00	\$ 5.74	\$4.93	\$ 1.40	-	-	-	-	-	-	-
5	6.10	4.15	4.67	4.50	-	-	-	-	-	\$1.76	-	-
11	7.45	7.45	4.03	3.94	1.40	-	*gypsum	*2300#	*\$9.57	-	-	-
12	8.13	6.87	4.68	3.00**	-	-	-	-	-	-	-	-
13	10.16	5.62	2.96	2.29**	-	\$1.17	-	-	-	.32	\$3.47	\$2.20
10	3.00	4.50	3.54	4.26	-	-	-	-	-	1.33	-	-
14	5.50	5.50	5.10	3.25	1.40	-	-	-	-	1.25	.10	.13
Av. all 1948	\$ 6.29	\$ 5.63	\$ 4.50	\$3.81								
Average 10 records in 1947												
1947	\$ 5.63	\$ 5.74	\$ 4.16	\$4.36								

\*On 40 acres only.

\*\*Operates own baler.

Table 6 presents an analysis of harvesting, fertilizing, and other cultural costs. The cost of baling was calculated at the commercial rate. Only one reported the application of commercial fertilizers.

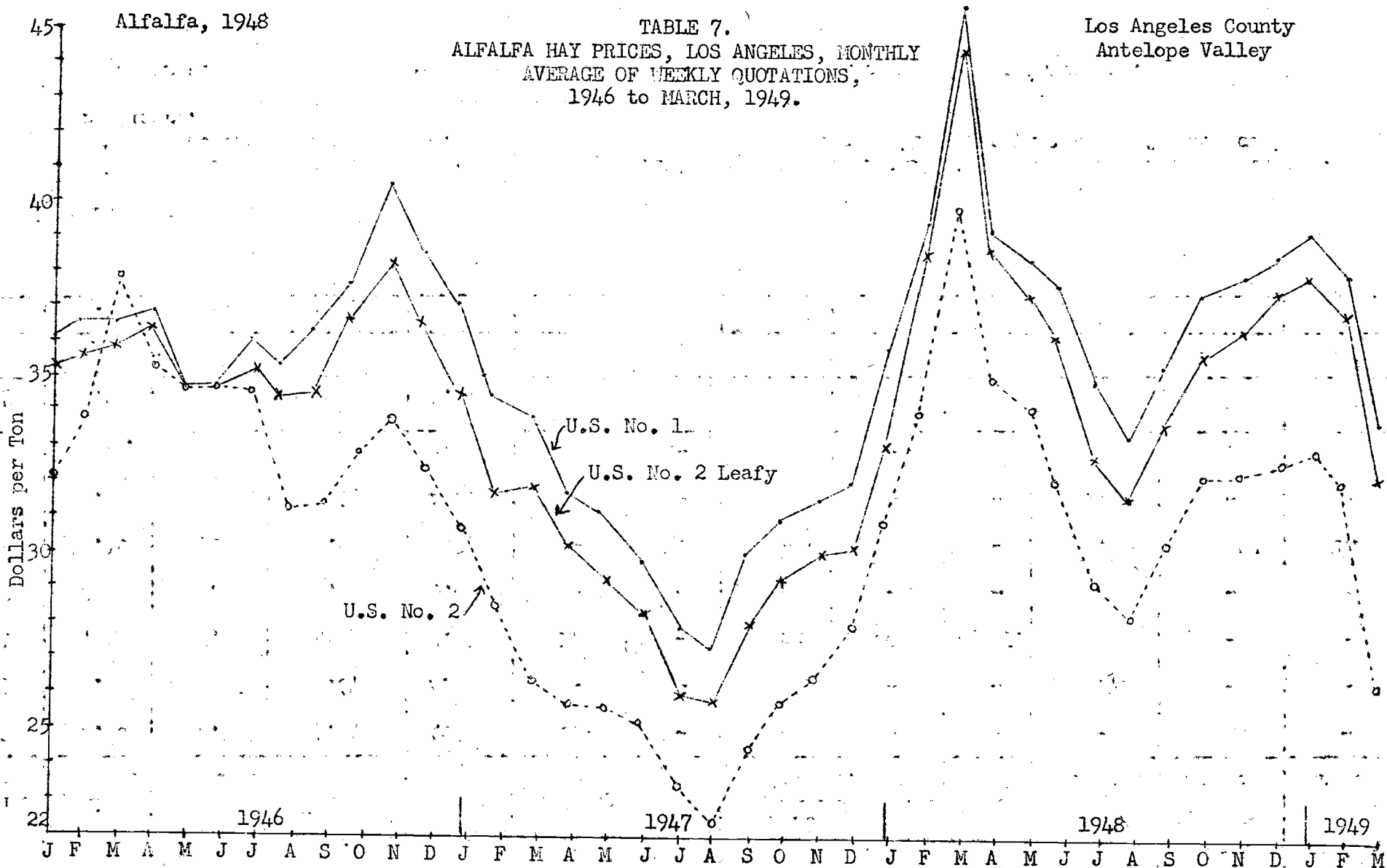
One grower (11) did some reseeding of spots in the field where the stand had thinned out.



Alfalfa, 1948

TABLE 7.  
ALFALFA HAY PRICES, LOS ANGELES, MONTHLY  
AVERAGE OF WEEKLY QUOTATIONS,  
1946 to MARCH, 1949.

Los Angeles County  
Antelope Valley



This graph pictures the spread in prices between the different grades of alfalfa. During the calendar year of 1948, the average spread between U.S. No. 1 and U.S. No. 2 was \$5.64 per ton. U.S. No. 1 and U.S. No. 2 Leafy had a much narrower spread of only \$1.44. This spread between the various grades is one of the reasons why every effort should be made to market high quality alfalfa hay. Getting a good price for the hay produced is as important as getting good yields.

TABLE 8. ALFALFA HAY - ESTIMATED ACREAGE, YIELD, PRODUCTION, AND FARM PRICE, CALIFORNIA (5-YEAR AVERAGES 1920-1939, ANNUAL 1940-1946).\*

Year	Acreage harvested (acres)	Yield per acre harvested (tons)	Production (tons)	Average price per ton (dollars)
1920-24	765,000	3.62	2,770,220	17.34
1925-29	811,000	3.65	2,960,000	14.18
1930-34	810,600	3.88	3,141,200	9.08
1935-39	752,800	4.30	3,237,800	10.18
1940	848,000	4.10	3,477,000	7.50
1941	797,000	4.40	3,507,000	11.80
1942	845,000	4.20	3,549,000	15.50
1943	896,000	4.50	4,032,000	17.50
1944	977,000	4.50	4,396,000	19.40
1945	1,026,000	4.20	4,309,000	19.10
1946	1,005,000	4.60	4,623,000	23.70

\*California Field Crop Statistics, July, 1947. California Crop and Livestock Reporting Service, page 42.

TABLE 9. ALFALFA PRODUCTION IN WESTERN STATES, EASTERN STATES, AND TOTAL UNITED STATES, 1938-1945

Year	Western States* (1000 tons)	Eastern States (1000 tons)	United States (1000 tons)	Western States % of total (Per cent)	Eastern States % of total (Per cent)
1938	11,425	17,123	28,548	40.0	60.0
1939	11,154	15,740	26,894	41.1	58.9
1940	11,737	18,382	30,119	38.9	61.1
1941	12,122	20,266	32,388	37.4	62.6
1942	12,186	24,292	36,478	33.4	66.6
1943	12,392	20,073	32,465	38.2	61.8
1944	12,783	18,919	31,702	40.3	59.7
1945	12,799	20,872	33,671	38.0	62.0

\*Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Washington, Oregon and California.

The 11 Western States averaged 52.3% of the total alfalfa hay production for the United States during the period from 1921-30. From 1938 to 1945 these same states averaged 38.4%, or a loss of nearly 14%. This indicates a decided loss in importance of the Western States as the principal alfalfa producing states of the United States.